REMARKS

Claims 1 and 3-40 are pending in this application. Claims 33-40 have been withdrawn from consideration. Claims 1 and 3-32 have been rejected in the final Office Action dated April 14, 2008. Reconsideration and allowance in view of the Examiner interview, as well as the following amendments and remarks are requested. By this Amendment, Applicant's have amended claims 1, 3, 5, 6, 7, 8, 9, 12, 13, 14, 20, 23, 26 and 31, cancelled claim 4 without prejudice, and added new claims 41-52. Support for the amended claims can be found in the specification and claims as originally filed. For example, support can be found at page 2, second full paragraph; page 8, second full paragraph; page 9, first paragraph; page 10, paragraph 1; page 11, paragraph 1; Fig. 6; and page 12, paragraph 1; Fig. 9 in the present specification. The amended and new claims introduce no new matter, and thus, their entry is respectfully requested.

This Response follows a personal interview held May 29, 2008 between Applicants, Applicants' attorney, Steve Giovannetti, and Examiner Thukhanh T. Nguyen, wherein the claimed invention was discussed in view of the cited art. Proposals for amending the claims to describe the configuration and/or dimensions of the substantially continuous gap for venting vapor or steam, and presenting arguments supporting the amendments and distinguishing the claims over the prior art devices having air passages and holes, were discussed. The courtesies extended Applicants and Applicants' attorney during the Examiner interview are sincerely appreciated. The remarks and amendments presented in this response make of record and further address the issues discussed during the interview.

Claim Rejections – 35 U.S.C. § 101

Claims 1 and 3-32 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

In response, Applicants have amended the claims to overcome this rejection. Thus, Applicants respectfully request that the rejections be reconsidered and withdrawn.

Claim Rejections – 35 U.S.C. § 112

Claims 1 and 3-32 stand rejected under 35 U.S.C. § 112 as failing to set forth the subject matter which applicant(s) regard as their invention.

In response, Applicants have amended the claims to overcome these rejections. Thus, Applicants respectfully request that the rejections be reconsidered and withdrawn.

Claim Rejections – 35 U.S.C. § 102

Claims 1, 3 and 7-10 stand rejected as being anticipated by Hanamoto et al. (U.S. Patent No. 4,545,752). The Office Action contends that Hanamoto teaches an injection molding apparatus comprising a cavity and a gap in accordance with the present invention. Applicants respectfully disagree for the following reasons.

As amended, the claims of the present invention recite "a gap in communication with the cavity and the exterior of the mold apparatus for venting vapor or steam;
wherein the gap comprises a first portion which extends in a substantially continuous manner along the cavity inner surface, wherein the first portion has a width that is in a range from about 0.001 inches to about 0.030 inches, and a length that is substantially

greater than said width." For example, a molding apparatus having the claimed gap dimensions is shown in the present specification at Figure 6, where the fist portion of a gap is identified as element number 70; at Figure 9, where the fist portion of a gap is identified as element number 140; at Figure 4, where a substantially continuous gap is visible between the male and female mold halves; and in other figures throughout the specification.

Hanamoto does not teach or suggest a device with the above limitations. Instead, Hanamoto discloses a device for use in injection molding and thermorforming plastic sheets. Col. 1, ll. 7-10. The device of Hanamoto includes air passages 58 for use in discharging air from the cavity of a female mold 18. Col. 6, ll. 13-15. These air passages 58 (see, e.g., Fig. 2) are holes, which do not comprise a first portion which extends in a substantially continuous manner along the cavity inner surface, wherein the first portion has a width that is in a range from about 0.001 inches to about 0.030 inches and a length that is substantially greater than said width.

The small width and the substantial continuity of the claimed gap are significant for at least two reasons. First, these features allow for venting of vapor and steam produced during heating or baking from the cavity, without a significant loss of material. The claimed gap having a first portion which extends in a substantially continuous manner along the cavity inner surface, wherein the first portion has a width that is in a range from about 0.001 inches to about 0.030 inches and a length that is substantially greater than said width, has sufficient area to permit the evacuation of a large volume of steam from the mold cavity. A large volume of steam is created as a result of the large amount of energy/heat needed to convert the water present in the baking mixture to

steam, which necessarily causes the mixture to expand to fill the cavity. However, the gap also has a small enough width where the gap is in direct communication with the cavity to prevent the escape of a significant amount of the mixture from the cavity while the large volume of steam is being evacuated.

Second, the claimed gap also provides a self cleaning mechanism, which prevents substantial clogging of the gap with material that is often present in dirty steam or vapor, and which tends to accumulate after repeated use of the device. The gap provides enough area to allow steam to constantly occupy sections of the gap during baking, even when other sections of the gap may include a buildup of material. Because steam is always present in sections of the gap, the steam is able to pull and push any material buildup out to the exterior of the mold apparatus, thus, providing a self-cleaning mechanism which prevents substantial clogging of the gaps.

In contrast, the holes or passages 58 of Hanamoto do not comprise a first portion which extends in a substantially continuous manner along the cavity inner surface, wherein the first portion has a width that is in a range from about 0.001 inches to about 0.030 inches and a length that is substantially greater than said width. Indeed, the individual holes and passages would need to be much wider than the claimed dimensions to evacuate air pockets and still avoid substantial clogging, in which case the holes would not prevent the escape of a significant amount of the mixture from the cavity. Furthermore, the self-cleaning mechanism of the claimed invention would not be possible in individual holes or air passages having the claimed width. Such holes or passages would be completely blocked, obstructed, or plugged with starch and other particulates or materials carried in the dirty steam or vapor, especially after numerous cycles, causing the mold to cease functioning. Such holes or passages lack the

necessary area for steam to enter and pull and push any material build-up out to the exterior of the mold apparatus once the holes are clogged or obstructed. Thus, it is clear that Hanamoto does not teach nor contemplate the claimed apparatus as amended.

Additionally, regarding Hanamoto, the Office Action reads "the gap is very small and located on an upper mold (18), thus, is capable of preventing the escape of the molding material during the molding process." OA p. 3. The Office Actions also reads because of the location of the air passages - on the top of the upper mold plate, and because of the present of the pattern sheet 32, molding material 60 cannot travel through the gap during a normal molding process, because it will have to travel up against the gravity. Also, if the material traveled into the air passages it would result in indentation or undesired recesses on the surface of the products - a problem Hanamoto has recognized and wanted to avoid (col. 6, lines 6-29)."

Applicants respectfully disagree with this reading of Hanamoto. The female mold 18 does not appear and is not described as an "upper" mold. In fact, Figure 2 of Hanamoto shows the female and male molds 18 and 16 are both arranged vertically, side-by-side as "a pattern sheet 32 is vertically transported between" them. Col. 3, ll. 48. Thus, there would be no requirement to "travel up against the gravity" as the female mold 18 is moved toward the male mold 16 by a ram 22 and the resulting cavity 60 is injected with molten plastic material. Col. 6, ll. 38-44. Also, Hanamoto states that "the cavity of the female mold 18 is evacuated…so it is not needed to provide a plurality of air discharge passages. Accordingly, the trace of the openings of the air passages 58 is almost not left on the surfaces of molded articles." Col. 6, ll. 24-29 (emphasis added). Thus, Hanamoto does not teach that indentation or undesired recesses is

completely avoided, implying that the sheet 32 (which the examiner is equating to the mixture skin in the claimed invention) or some material does get pulled into the air passages.

Thus, in view of the above arguments and amendments, Applicants submit that the claimed apparatus is not anticipated by Hanamoto, and respectfully request that the rejections be reconsidered and withdrawn.

Claim Rejections – 35 U.S.C. § 103

Claims 4-6 stand rejected under 35 U.S.C. § 103 as being obvious over Hanamoto et al. as applied to claims 1, 3 and 7-10 above, and further in view of Oono et al. Applicants respectfully disagree.

Applicants submit that Oono does not correct the deficiencies of Hanamoto, and as such, the claims are not obvious because not all elements are taught by the cited art. Indeed, Oono teaches an injection molding apparatus including an air exhaust hole 8 or a plurality of small suction holes 8a connected to a wider exhaust hole 8. (See e.g., Fig. 19). The holes of Oono do not provide a gap that comprises a first portion which extends in a substantially continuous manner along the cavity inner surface, wherein the first portion has a width that is in a range from about 0.001 inches to about 0.030 inches, and a length that is substantially greater than said width. Instead, Oono teaches a plurality of separate individual holes in communication with a cavity of the injection molding apparatus, and as stated supra, such individual holes would not prevent substantial clogging if they had the claimed dimensions, lacking the area necessary to self clean. Also, if the holes were larger, they would not prevent the escape of a significant amount of the mixture from the cavity. Thus, because the cited

art, neither alone nor in combination, teaches or suggests all of the elements of the claims as amended, such claims are not rendered obvious over the cited art.

Also, Applicants respectfully disagree with the reasoning provided on page 5 of the Office Action for combining Hanamoto and Oono, which states that it would have been obvious "to modify Hanamoto by providing a plurality of small suction holes…because the small portion of the venting gaps would provide uniform venting for the cavity without causing deformities on the surface of the forming product." To the contrary, Hanamoto states:

> "[i]n the latter case, the female mold 19 must be provided a relatively large number of air discharge passages 58. However, the openings of such passages 58 are imprinted on the surface of the molded articles or finished products. As a result, such arrangement is not preferable in practice. Furthermore, when the air remains in the cavity of the female mold 18, undesired recesses are formed on the surfaces of the molded articles or finished products. However, according to the present invention, the cavity of the female mold 18 is evacuated as described above, so that it is not needed to provide a plurality of air discharge passages. Accordingly, the trace of the openings of the air passages 58 is almost not left on the surfaces of molded articles or finished products." Col. 6, ll.

In contrast to the position taken in the Office Action, Hanamoto states that the evacuation of air and the use of fewer air passages overcomes the problem of undesired recesses formed on the surfaces of the molded articles or finished products caused by a plurality of air discharge passages. Thus, while the plurality of small suction holes are clearly distinguishable from the claimed gap, as discussed supra, they are also viewed as part of a problem Hanamoto tries to avoid.

Additionally, Applicants respectfully disagree with the reasoning provided on page 5 of the Office Action for combining Hanamoto and Oono, which states that "Hanamoto has recognized that small size of the venting gaps would prevent the trace of the gaps on the surfaces of the product (col. 6, lines 27-29)." Hanamoto does not

discuss the benefit of smaller holes, but instead discusses having fewer holes and evacuating air to avoid the undesired recesses formed on the surfaces of the molded articles or finished products caused by a plurality of air discharge passages. Thus, not only do Hanamoto and Oono fail to teach all of the claimed elements, it would not have been obvious to modify Hanamoto with the teachings of Oono for the additional reasons discussed above.

Thus, in view of the above arguments and amendments, Applicants submit that the claimed apparatus is not obvious over Hanamoto in view of Oono, and respectfully request that the rejections be reconsidered and withdrawn.

Additionally, Claims 11-32 stand rejected under 35 U.S.C. § 103 as being obvious over Hanamoto et al. as applied to claims 1, 3 and 7-10 above, and further in view of Atake (U.S. Patent No. 6,220,849).

Applicants submit that Atake does not correct the deficiencies of Hanamoto, and as such, the claims are not obvious because not all elements are taught by the cited art. Atake discloses a sheet decorating injection molding machine which includes an endless suction groove 16 connected to several suction holes 17, connected conduit 19 and an external vacuum pump, via suction passages 18, to constitute a suction system. Col. 8, ll. 54-6; Fig. 10. The suction groove 16 is formed in the inner parting surface 14b surrounding the open end of the hollow 13. Col. 8, ll. 37-41; Fig. 10. A cavity is formed by female mold 12 and male mold 25 coming together, as shown in Fig. 13.

In contrast to the claimed invention, first, the suction groove 16 is not in communication with the cavity as it is closed off by the sheet S and the male mold 25, from the cavity. See Fig. 13. Second, Atake does not disclose a gap comprising a first portion with a width that is in a range from about 0.001 inches to about 0.030 inches,

and a length that is substantially greater than said width. Instead, Atake discloses groove 16 which is large enough to attract and receive sheet S through a vacuum, which is its purpose, so it would have such a small width. Col. 8, ll. 37-39; Col. 14, ll. 24-27. Third, groove 16 and suction holes 17 do not make up a gap comprising a first portion and a second portion wherein the second portion is wider than the first portion. Because the cited art, neither alone nor in combination, teaches or suggests all of the elements of the claimed invention as amended, such claims are not rendered obvious over the cited art.

Additionally, applicants respectfully disagree with the reasoning provided on page 6 of the Office Action for combining Hanamoto and Atake, which is the same reasoning provided on page 5 of the office action, and distinguished above.

Thus, in view of the above arguments and amendments, Applicants submit that the claimed apparatus is not obvious over Hanamoto in view of Atake, and respectfully request that the rejections be reconsidered and withdrawn.

Applicants further note that Hanamoto, Oono and Atacke are all directed to injection molding machines that transfer sheet patterns to molds. In each machine the sheet is in place across the mold cavity, extending out of the mold to the exterior of the mold, and it is created prior to adding any mixture to the mold. The office action has equated this sheet with the skin of the mold in the claimed invention. See OA at page 3. In contrast to the claimed invention, the cited art does not, teach a mold apparatus where the mold skin is created under baking conditions after the mixture is added to the cavity, and the skin is enclosed within the mold apparatus cavity without escape of a significant amount of the mixture. Also, the cited art does not teach an apparatus whereby the mold is closed around a mixture prior to fully forming the skin on the

mixture, and the only communication between the skin and the exterior of the closed mold is through a gap. The sheets in the cited art are sandwiched between a female and male mold, extending out to the exterior of the mold apparatus where they would have to be trimmed, and constitute an escape of mixture. Thus, the cited art is clearly distinguishable from the claimed invention.

Finally, new claims 47 and 48 are novel and nonobvious for the reasons discussed above and because the cited art does not teach a gap which spans a distance extending from the cavity to the exterior of the mold apparatus. In the cited art, the holes communicate indirectly with the exterior via other holes or conduits. New claims 41-46 and 49-52 are also novel and nonobvious for the reasons discussed above and for the additional limitation recited therein.

Long Felt Need

While Applicants maintain that the amended claims are not obvious for the reasons presented above, Applicants also submit evidence of a persistent and recognized long felt need that has now been satisfied by the presently claimed invention. As set forth in the declaration of Elie Helou Jr., "In manufacturing the claimed mold apparatus having a gap with the claimed dimensions, a persistent and recognized long felt need for a more efficient mold apparatus that creates a finished article devoid of the weak points present in molded articles created by existing mold technology, without a significant loss of material or waste during the production of such articles, and which also minimizes excess manufacturing steps has been satisfied."

According to Mr. Helou, "the baking mold industry has for many decades used a technology based on heated molds with relatively large vents to produce molded articles (e.g., ice cream cones, wafer cookies, etc.). The vents are required first to

permit the escape of air as the mold is filled and then to allow the escape of steam as the dough or batter bakes. However, in the existing technology, the vents are large enough that dough or batter is always expelled along with air and steam. This technology has therefore always produced articles with stems or flashings or other similar features that then need to be removed or trimmed in order to create the finished product. In some cases as much as 30% of the initial material deposited into the mold is expelled via these vents. The expellation of material causes additional material and energy to be used, as well as creating weaknesses in the finished product, and thus requires additional manufacturing steps to be accomplished on articles at their weakest state, immediately after baking is complete. Furthermore, the use of fibers in the doughy mixture adds complexity in that the fibers strengthen the articles, and thus can cause localized defects at the trimming area unless the excess materials are trimmed very precisely. If the trimming process pulls on the stems, then the stems will tend to leave a crater or defect where the fibers have pulled additional material around the base of the stem. This tendency for the trimming process to remove more material than necessary leaves a defect(s) in the finished article. In almost all cases, the venting stems occur on the edges of the packaging, which is where the female and male molds split. This places the defects in the worst possible location, for example, at the edges of cups or baking containers."

"The baking mold industry currently uses technology that requires mold articles to be die cut or trimmed, or requires necessary secondary step(s) which not only increases part rejection rates, but also creates weaknesses where the product is normally needed to be strong, e.g., at the edges and/or rims of products. Until the development of the claimed invention, no one in the industry was able to produce

finished articles without stems, spurs, or flashings (“or net molded products”), with no significant excess material loss, and no need for trimming or other post molding process steps to have a finished substrate. Packaging articles, which are made using mold technology, are some of the lowest priced articles in the market place today, and any reduction in the number of steps required to produce such articles is critical in reducing the manufacturing costs to commercially viable levels. Several companies have spent close to a decade each and several millions of dollars attempting to simplify the molding process without success. Thus, a long felt need exists for a mold apparatus that could avoid the aforementioned undesirable properties in finished articles without the significant production of excess material or waste and minimize excess manufacturing steps. "

Mr. Helou states that he was able "to develop a mold that would not require secondary steps to produce the finished substrate or result in weakness in the finished articles, satisfying the long felt need for a more efficient and effective means to create molded articles. Over several months, the claimed mold apparatus was created and the required gap dimensions were found to be too small to be made using holes. This finding led to the development of the claimed mold apparatus having a substantially continuous gap with the claimed dimensions, which produces finished parts where no trimming is required because there is no significant escape of material. The claimed mold technology has allowed us to greatly reduce the capital equipment requirements and the complexity of our production line. Also, the claimed mold apparatus produces articles with stronger, nearly defect-free rims and edges that can be observed by comparing the handling characteristics of substrates created from standard molding technologies, which have weaker edges and require the doubling of walls at the edges

(e.g., as can be observed in existing ice cream cones), and parts created from the claimed molding technology. In fact, the ability to eliminate these secondary steps and to create relatively stronger products has allowed us to form a Joint Venture in the several millions of dollars range to commercialize this innovative technology. "

"In addition, because there is no significant escape of material in the claimed invention, problems with vent abrasion that commonly occurred with the old and existing technologies were eliminated, and the overall pressure inside the mold was also reduced. Further, the claimed mold gap technology has self cleaning properties which allow for a greater interval between mold cleanings. The claimed technology has also created an unusually large operational window, whereby functional products can be produced using a wider range of mix weights and formulations than is possible with the conventional or existing technology. "

Thus, the claimed technology has satisfied a long felt need, which is further evidence that it is not obvious over the cited art.

In view of the foregoing, it is submitted that the claims are in condition for allowance. A Notice of Allowance is respectfully requested.

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Respectfully submitted,

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